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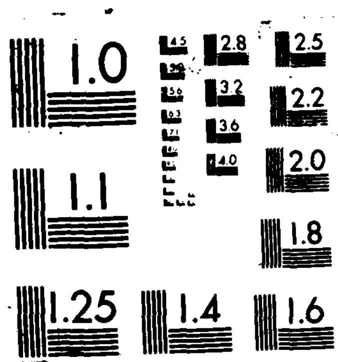
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METHOD OF OBTAINING THE MODIFIED CELLULOSE MATERIALS

by

I.N. Ermolenko, R.N. Sviridov, V.A. Popov

FOREIGN TECHNOLOGY DIVISION

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Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ё in Russian, transliterate as yё or ё.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	$\sinh^{-1}$
cos	cos	ch	cosh	arc ch	$\cosh^{-1}$
tg	tan	th	tanh	arc th	$\tanh^{-1}$
ctg	cot	cth	coth	arc cth	$\coth^{-1}$
sec	sec	sch	sech	arc sch	sech^{-1}
cosec	csc	csch	csch	arc csch	csch^{-1}

Russian	English
rot	curl
lg	log

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METHOD OF OBTAINING THE MODIFIED CELLULOSE MATERIALS

I. N. Ermolenko, R. N. Sviridov and V. A. Popov

Described is an invention for

Are known the methods of obtaining the modified cellulose materials by introduction into the cellulose by means of its oxidation of carboxyl groups with the subsequent substitution of these groups by metal ions.

For obtaining fibrous materials with high thermal stability and electrical conductivity is proposed salt of oxidized cellulose, which contains metal ions, to be subjected to heat treatment in vacuum or inert medium. Russian translation

Example. Flaxen cloth and paper, which does not contain the noncellulose ingredients (chromatographic, type Б), are selected as initial cellulose material.

These materials are oxidized by gaseous nitrogen dioxide to content 8% COOH-groups (according to the data of the zincacetate

method of analysis). Then the oxidized materials are processed by aqueous solution of sulfate aluminum (10 g/l) for obtaining the product of ion exchange. This product preserves fibrous nature and strength of the selected cellulose material.

After ion exchange is carried out the heat treatment of fibrous material in the vacuum (10^{-3} mm Hg) with a slow rise in temperature from 200 to 800°C. The control of process is achieved with respect to a change in the weight of fiber. Above the temperature indicated, the weight practically does not change.

For testing properties the material is heated in the vacuum to 1350°C. This does not cause melting or any of the decomposition of fibers, in this case the appearance and the dimensions of product do not change. The latter is highly porous, which is especially substantial for its use as a heatproof material. The strength of fibers is considerably less than initial. However, measurement of tensile strength of fibers shows that also under these conditions they have a strength about 3 g/мм²; the bending of fibers at angle of 90° does not cause their fracture.

The obtained products of thermal decomposition, both the oxidized cellulose and its salts, are good conductors with very low resistance, i.e., they are close in properties in this respect to carbon fiber. The obtained product is chemically resistant,

does not dissolve not in one of the tested organic solvents, and it is also resistant to the action of the concentrated acids (sulfuric, salt, nitric) and the alkalis both at room temperature and at the boiling point of the latter.

Object of Invention

The method of obtaining modified cellulose materials by introduction into cellulose by means of its oxidation of carboxyl groups with their subsequent substitution by metal ions, is characterized by the fact that, for the purpose of obtaining fibrous materials with high thermal stability and electrical conductivity, salt of the oxidized cellulose is subjected to heat treatment in vacuum or inert medium.

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